

REMARKS

Claims 1 and 7 stand rejected under 35 U.S.C. 103(a) as unpatentable over Zanetel et al. ('098) in view of Porter ('654) and Gronau et al. ('812). The Office action says that Zanetel discloses a valve 37, 38 that maintains fluid pumped to the actuator at a higher pressure than pressure of the fluid pumped through the clutch 4 cooling. Figures 2-4 of Zanetel disclose an orifice 37 in series with a flow control valve 38. The orifice 37 reduces line pressure entering valve 38 from 250 psi. to 60 psi. Valve 38 switches between a high flow rate and a low flow rate in accordance with differential pressure forces and the force of a spring 48 applied to opposite ends of a valve spool. Line pressure at 250 psi is fed forward to one end of the spool. The opposite end of the valve spool receives the sum of the force of spring 48 and a pressure force representing the greater of pressure in the transmission brake 29 and pressure in the master clutch 25. The balance of these oppositely directed forces determines the high-flow rate and low-flow rate through valve 38. Valve 38 is not a pressure control valve, as the amended claims define the present invention. Instead, valve 38 is a flow control valve.

Claim 1 defines the present invention such that the valve maintains the fluid pumped to the actuator at a higher pressure than the pressure of the fluid pumped through the clutch pack to cool the clutch. That function requires a pressure control valve, but Zantel discloses only a flow control valve.

Zanetel discloses a clutch 25, but is discloses no actuator. Yet, surprisingly, the Office action says that the Zanetel valve 38 maintains fluid pumped to the actuator at a higher pressure than the pressure of the fluid pumped through the clutch for cooling. The Office action makes no specific reference to the text or to the figures of Zanetel in support of this erroneous statement.

Because Zanetel does not disclose a controller or a multi-disc clutch, the Office action cites Porter for disclosing a multi-disc clutch 114, actuated and cooled by pulse-width modulated signals applied to a PWM valve 72 under the control of a controller 68. The Office action says that it would be obvious to provide a controller

in Zanetel. There is no need for a controller in Zanetel to control operation of valve 38 because the logic used to control valve 38 is entirely hydraulic logic. Combining Zanetel with Porter in this respect is in appropriate. The Office action relies on the disclosure of the present application rather than motivation suggested by Zanetel.

The Office action says it would have been obvious to control the pressure of the cooling fluid in Porter to be less than the clutch actuation pressure, as taught by Zanetel. As discussed above, Zanetel does not teach controlling pressure of the cooling fluid so that it is less than clutch actuation pressure. Zanetel does not have a pressure control system that would produce this pressure control because it provides a flow control valve that is not capable to control pressure in this way. Combining Zanetel with Porter in this respect is in appropriate. The Office action relies on the disclosure of the present application rather than motivation suggested by Zanetel or Porter. Therefore, it is not clear how the controller of Porter could be applied to control the flow control valve of Zanetel such that the pressure produced cooling system could be less than the magnitude of pressure pumped to the actuator. Porter and Zanetel are not combinable to produce either the valve or the controller of Claim 1.

The Office action cites Gronau for disclosing pulse-width modulated signals sent to an electric drive 150 of a pump and to hydraulic circuit control valves. The Office actions says that it would have been obvious to use a pulse-width modulated pump in Zanetel modified in view of Porter or in Porter as modified in view of Zanetel. Gronau may be combinable with Porter because each relies on electronic control and actuation, but Zanetel teaches away from electronic control and actuation. The PWM signals of Gronau cannot be combined in this respect with Zanetel, which has no electronic provision, nor is Porter combinable with Zanetel, as discussed above. There is complete silence in these references with respect to controlling pressure as recited in Claim 1.

Claims 4-6 stand rejected under 35 U.S.C. 103(a) as unpatentable over Zanetel in view of Porter and Gronau as applied to Claim 1 above, and further in view of Ackermann (US 2003/0089573). Ackermann was cited for disclosing an

accumulator. Claims 4-6 add elements or limitations to Claim 1, the independent claim from which the other claims depend. Having patentably distinguished Claim 1 over the cited prior art references, Claims 4-7 are similarly distinguished over the prior art.

In view of these remarks and the amendments to Claim 1, and 4-7 appear now in condition for allowance. Favorable action is respectfully solicited.

Respectfully submitted,

  
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